MISSOURI BOTANICAL GARDEN

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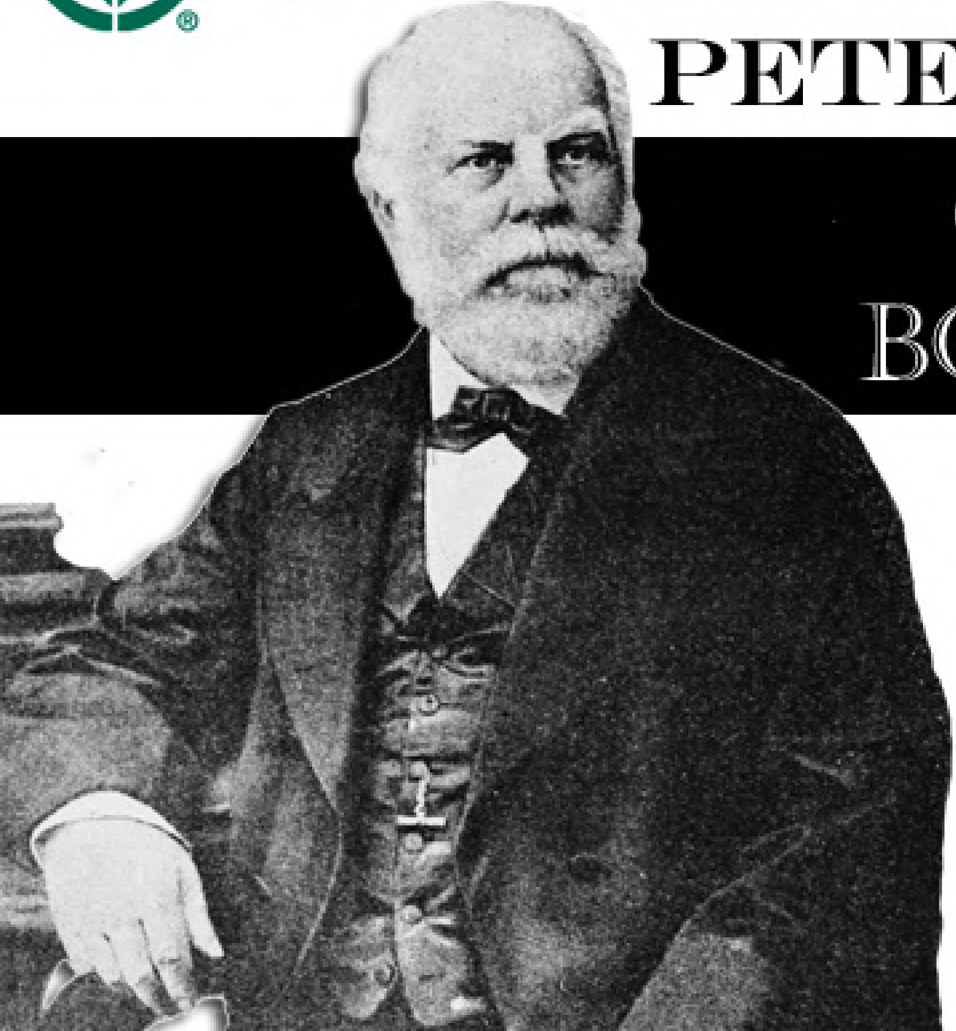
GEORGE ENGELMANN BOTANICAL NOTEBOOKS



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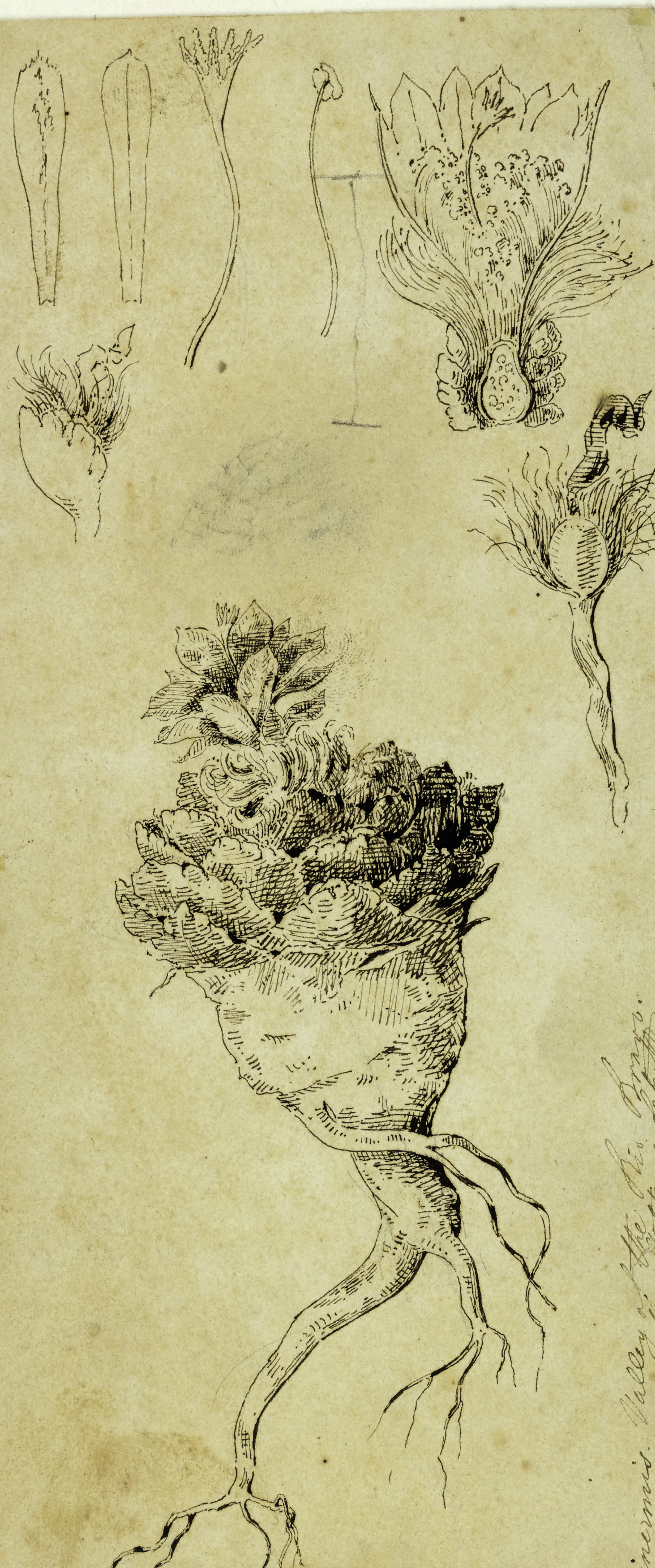
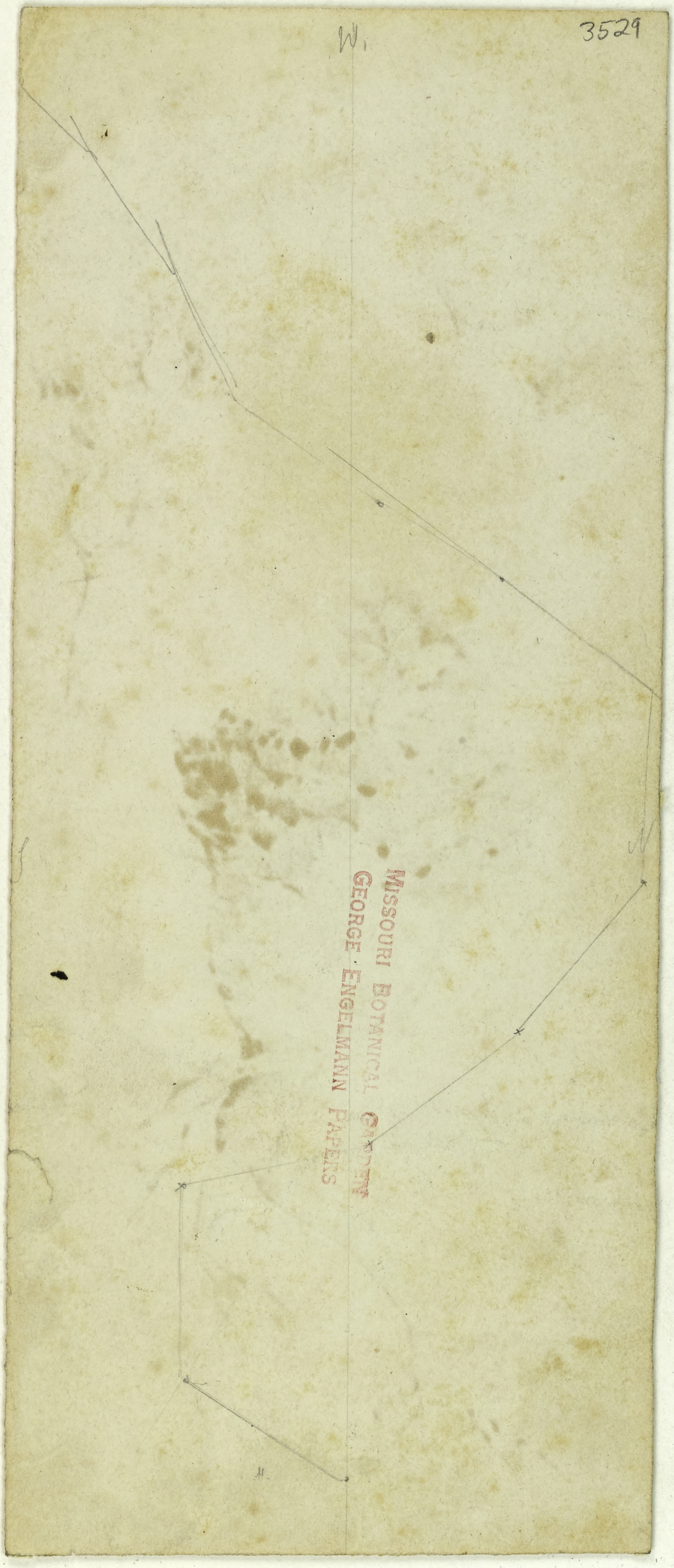


M. inermis. Valley of the Rio Bravo.
by Arthur Schott

3529



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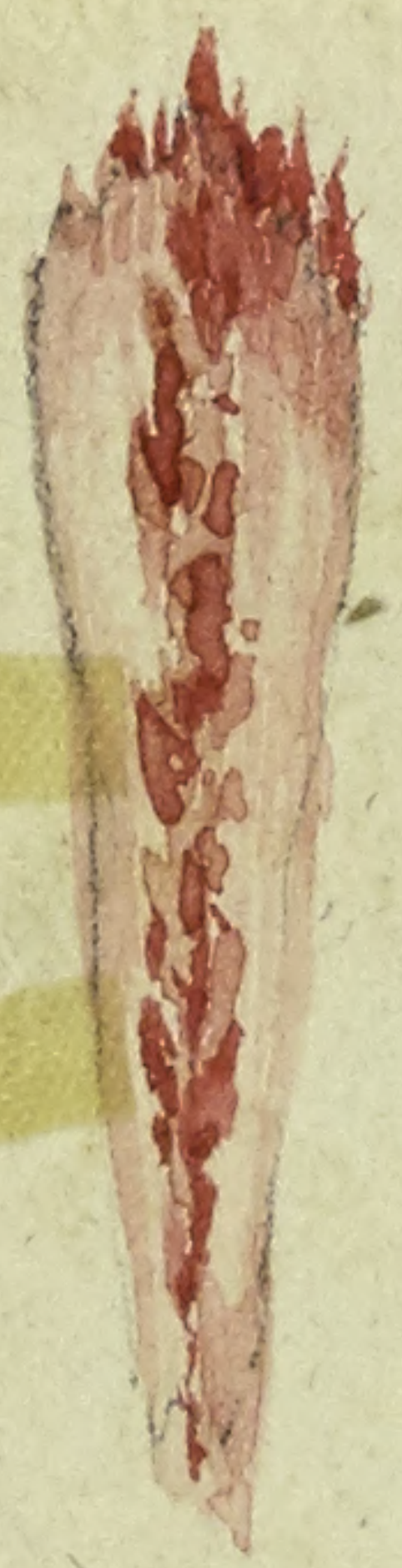
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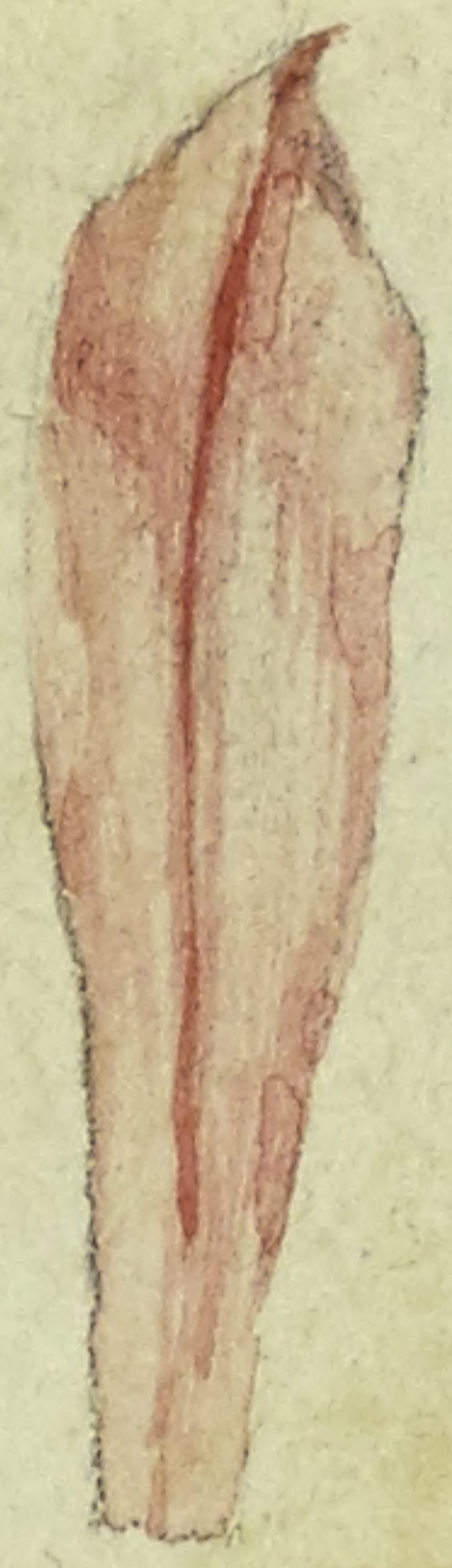
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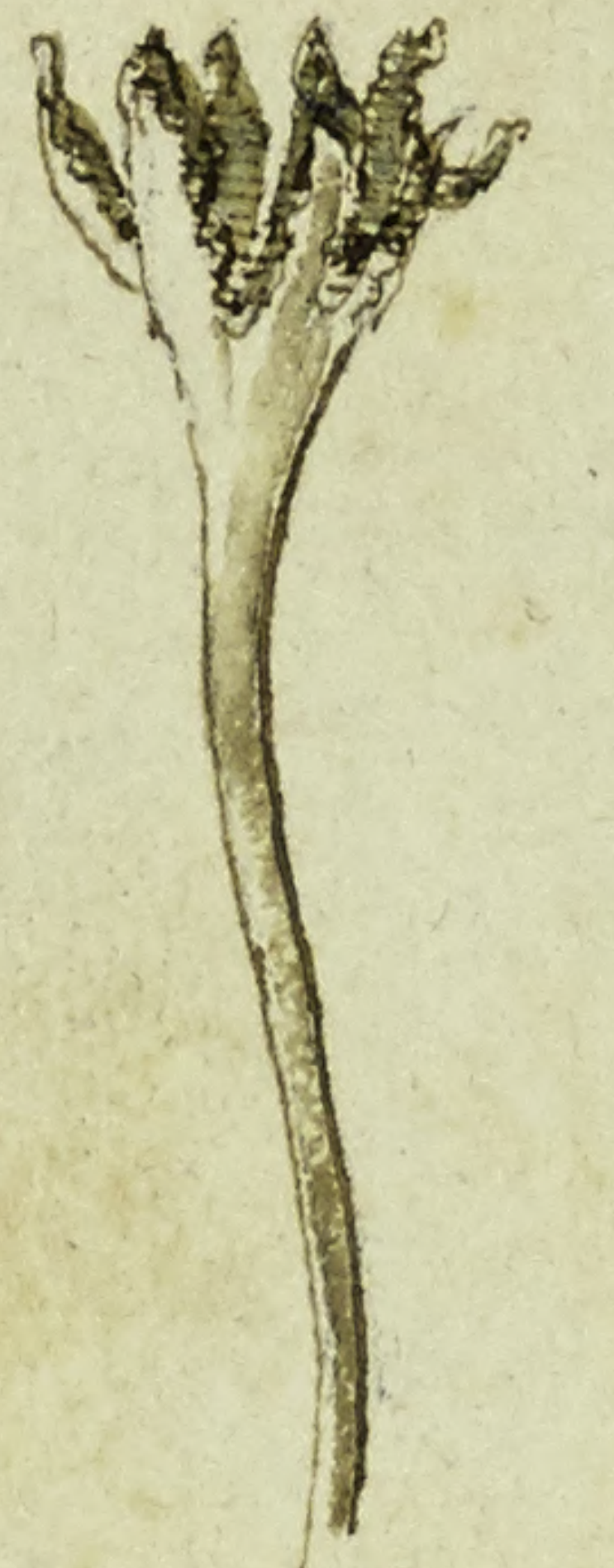
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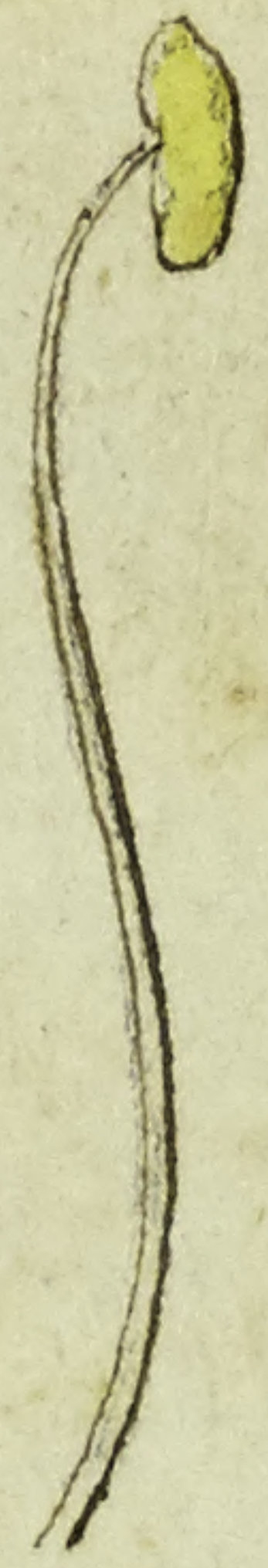
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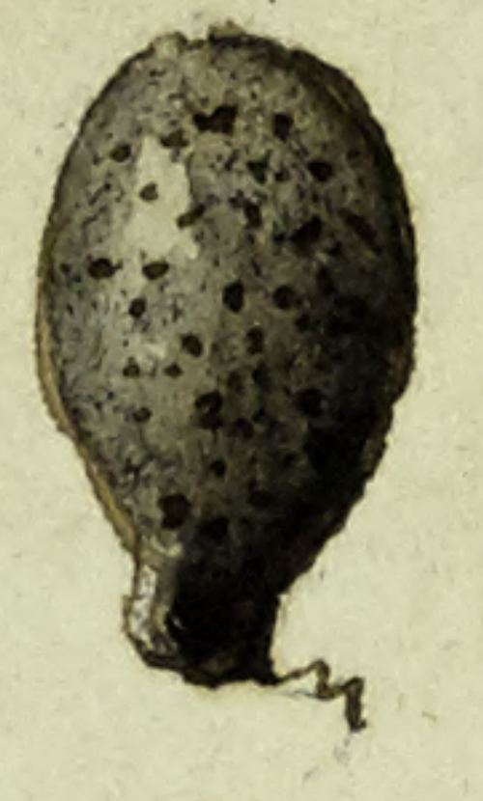
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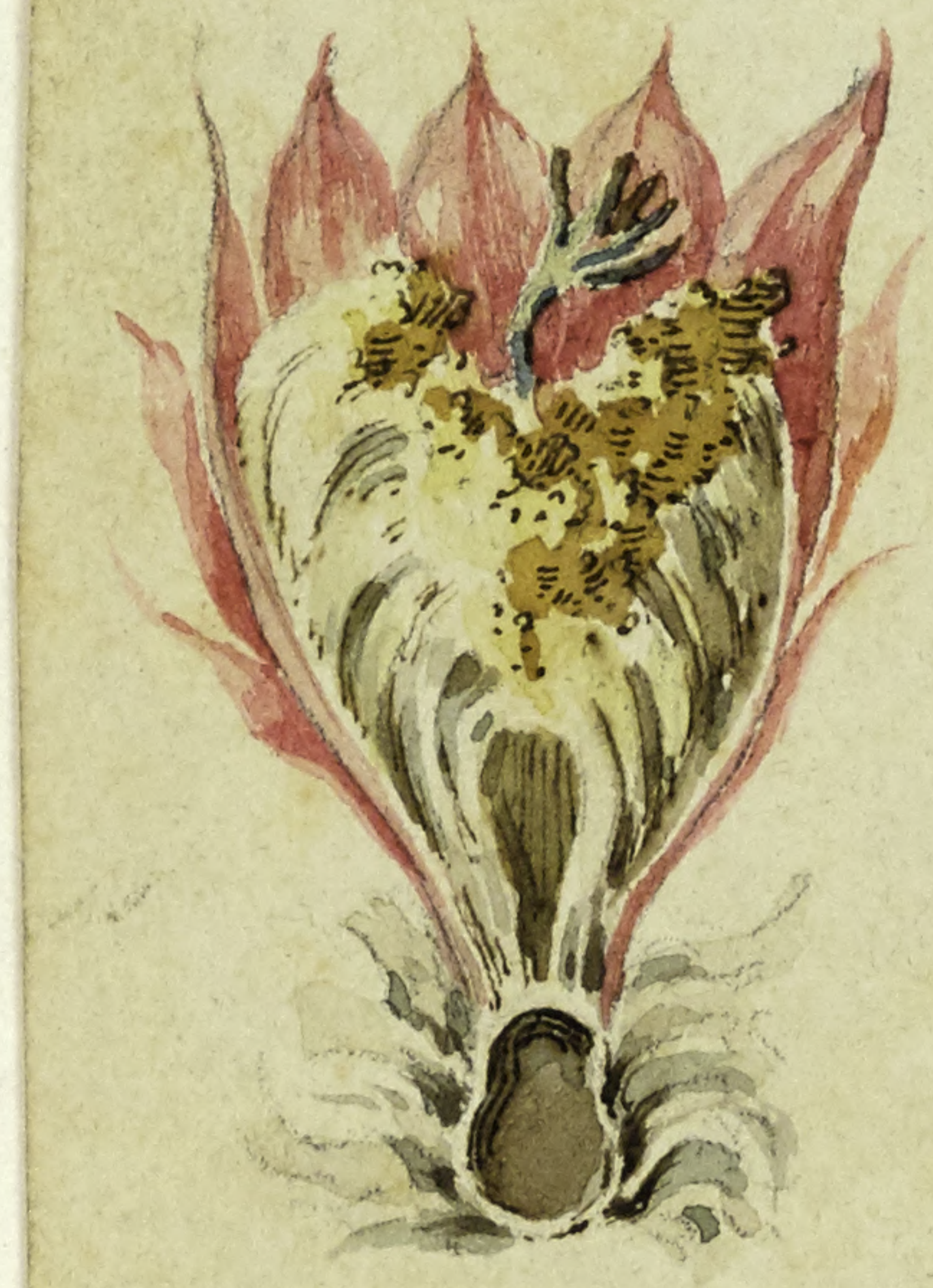
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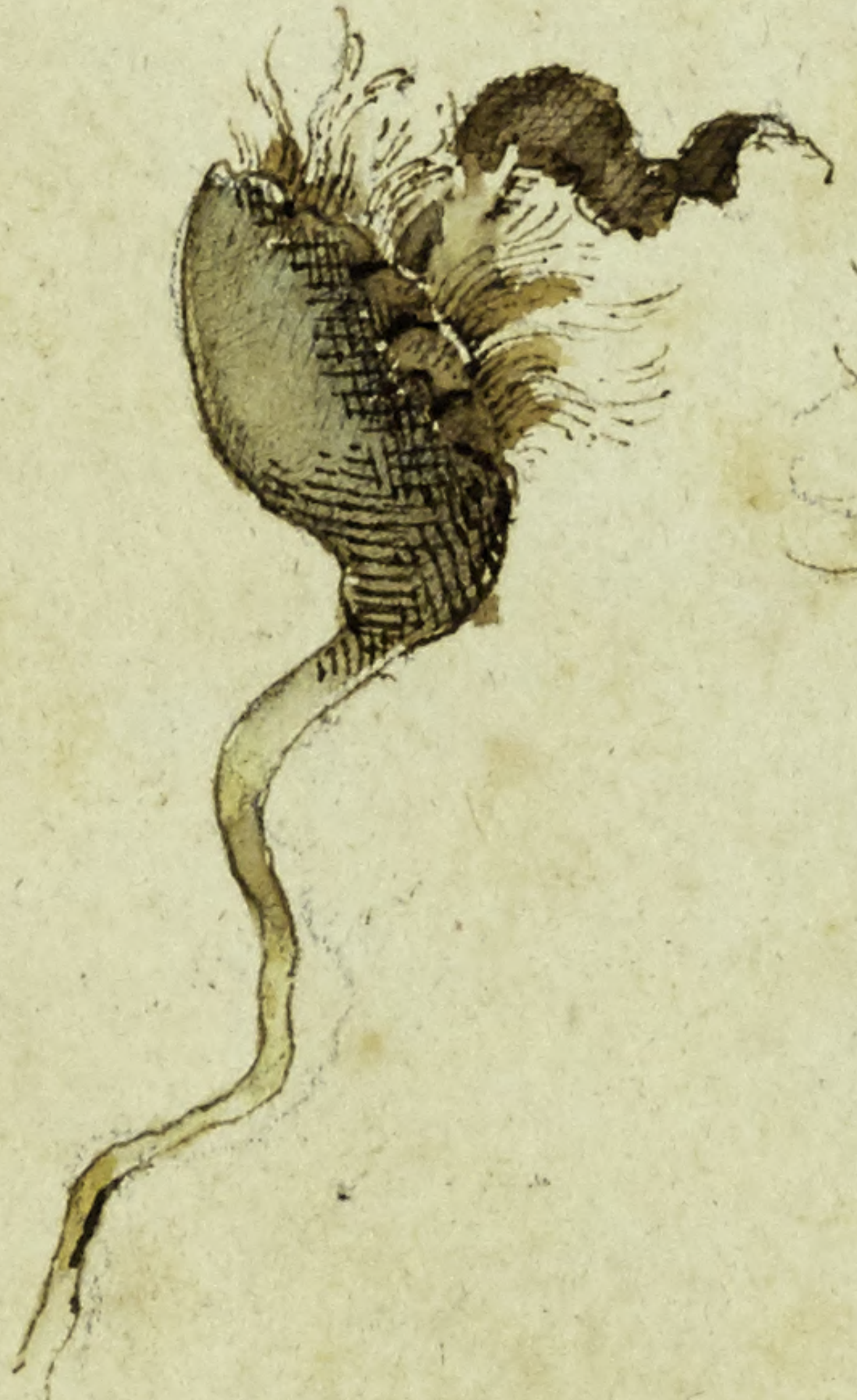
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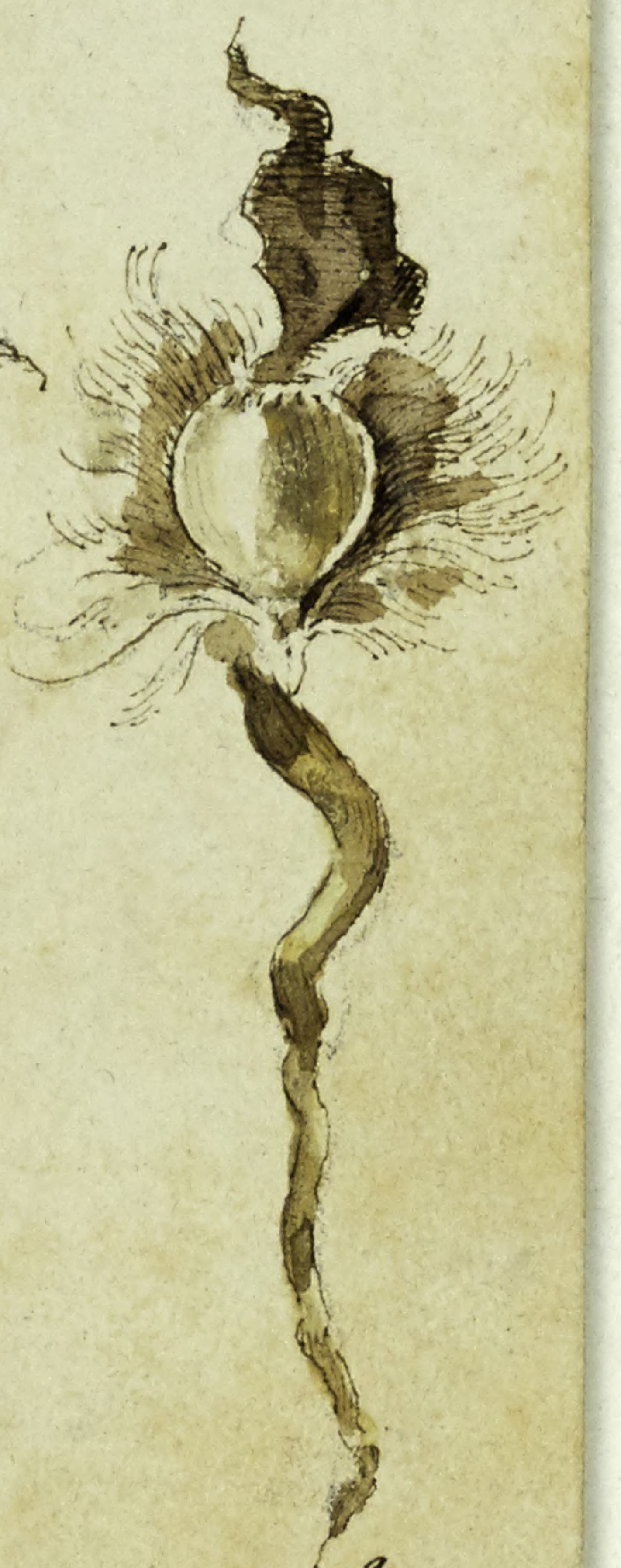
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A. Schott fecit 1852 Octob.

Dr. Georg Engelmann.

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MISSOURI BOTANICAL GARDEN

1 Durchschnitt der Blumenkrone u. d. ~~Stifte~~ Staub.
2 Profil einer Schuppe mit eingeschloss. ~~W~~ Wolle.
3 Samenkapsel mit untersteh. Wolle.
× 4 Petal mit gewimpert. Rand u. Mittelrippe.
5 Petal ~~[illegible]~~ einfach.
6 Pistill und Narbe.
7 Filament u. Anthere.
8. Samen.

Details von 1 – 5 natürl. Grösse; von 6 – 8 vergrössert.

2. Schuppe aus dem Centrum, welche stets die fruchtbaren zu sein scheinen. Unten Faserbündel, wie mit denen die andern Schuppen des [illegible] bis Wolle sitzt die Basis des Ovariums umgebend in d. Achsel der Schuppe.

3. Samenkapsel fast farblos, da sie gänzlich von der Schuppe, der Areola und der Wolle von der Luft abgeschlossen und verborgen ist.

×4. Gewimpertes Korollenblatt, wie ich es an dem ersten Exemplare fand, welches an Grazie u. Schönheit der Blumen alle übrigen übertraf.

3530

Anhalonium vermoosum

~~acaule~~ ~~depressum~~, tuberculis ~~basi~~ foliaceis complanatis superne ~~incrassatis~~ triquetris, acutis, obliq ~~apice superiore~~ epidermi dura ~~tectis~~ deltoideo-retusis densis triangulatis ~~deltoideis~~ retusis sulcis ~~longitudinalibus~~ 3 (mediano profundiori villosissimo ~~lateralibus~~ ~~lenioribus~~ levibus), ~~transversalibus~~que pluribus exarata unde et in verrucas plurimas depressas divisa marginque crenata; —

tubercles in 5.8 spiral rows —

Engelmann,

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MISSOURI BOTANICAL GARDEN

Dr Engellmann.

My sister has had the fever again as strong as she had yesterday. She has but three quinine pills left. If you think it advisable to increase the dose tomorrow, will you be kind enough to send her some, and specify how many she must take

I am with regard

Yours

C. Polkowska.

3531

Mamillaria. Schotii. n. sp ?

Axis flattened-hemispheric. 4½ inch diameter vertical diameter 2½ inch - Composed of spiral rows of tubercles nearly horizontally disposed -

Tubercles triangular, thickened or pyramid shape. extending horizontally smooth & carinate below, rugose-tuberculate, or furrowed above terminating in a blunt point - without spines!

Marked above by a fissured areolae bedded with long wooly fibres - vertex of the main axis very wooly surrounding the flower

Length of larger tubercles measured along the line of the fissured areolae 1¾ inch. - breadth 1¼ inch

Flower pink - (outer) sepals whitish fleshy obovate mucronate (inner) longer (1 inch) spathulate mucronate slightly lacerate. tube short

Stamens numerous one half the length of the petals a little shorter than the radiate stigmas

Pistil 7/8 inch long slender below with 8 stigmatic rays above. slightly spreading & partly bifurcated

Hab - Crevices of Siliceous limestone & Cretaceous rock. Cañon Rio Grande full grown plant resembling in external appearance a pine cone with thickened scales -

Dr Parry Nov 1852

3532

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✝ The flowers (in Schotts specimens) are about 2 inches long, somewhat campanulate, petals "lemon yellow" with a brownish tint along the midribs. Base of tube naked, the filaments separating about a line above, from the (common) mass of the tube. Stigma with 13 filiform stigmata. — [illegible]

Herrn Dr. Engelmann

3533

ones they are often over one inch distant. The 4 principal central spines are 2-2½ inches long; the ~~upper and lower~~ lateral ones more quadrangular, the upper and lower ones ~~flat~~ the former ~~above~~ carinate above, the latter below; these one rather the longest, and ½-1¾ l. broad; ~~somewhat~~ curved at the point, or almost straight, never in the specimens before me, hooked. All the other spines are ½-2 inches ~~long~~, the lowest one only 1 inch long; ~~the~~ three to five ~~3 to 5~~ radial spines ~~are arranged~~ below the 4 central ones, and ~~3 to 5~~ above them, 3 of which are ~~often~~ generally ~~brought into the center~~ ~~[illegible]~~ pushed in to the center by the flexuous bristly spines which fill up the space between the ~~upper~~ and ~~upper~~ radial ones and partly surround the latter; thus it may be assumed that in the fully developed plant 7 central spines are found.

At the upper end of the areola we meet with the same obtuse cylindric ligneous (when young fleshy) glands which divide the spiniferous from the floral areola in Ech. setispinus and its relatives; they appear only during the flowering period and on floriferous areolae, and are ~~probably~~ analogous to the hemispherical glands in the groove of the tubercles of some Mamillariae, which have therefore been distinguished as "glanduliferae". These glands in our species I find 3-5 in number about 1 line long. ‡

The single fruit before me is globose, 8 l. in diameter, crowned by the ~~withered~~ remains of the flower, ~~altogether~~ near 2 inch long. Dr Le Conte ~~remarks~~, has noticed "~~a crown of yellow~~

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" yellow fruit, apparently 2 to 2½ inches long forming a crown on the plant."

The dissection of the dead flower shows a structure very similar to that of E. Wislizeni; petals apparently fleshy and narrow; stamina numerous, ~~very few~~ from the base ~~of the tube~~, mostly from the middle and the upper thickened edge of the short tube. Style 10 li. long, divided nearly down to the middle into 14 suberect filiform stigmata. Seed black, oblique obovate, compressed, carinate on lower part of back somewhat shining and very lightly pitted; 0.8–0.9 l. long; hilum small, oval; albumen rather small, embryo ovate straight, with short hooked cotyledons.

none

Echinocactus Wislizeni is distinguished by the less flattened, less flexible, stouter spines; the lower central one being channeled, and strongly hooked; the distinction indicated by the ~~hooks~~ spines is confirmed by the shape and structure of the seed, and thus the plants found on ~~the~~ Colorado ~~plant~~ and ~~those on~~ the Rio Grande proved to be distinct species, representatives of the same ~~form~~ type in different regions. —

there are only 3 lower and 3 upper stouter radial sp. all others are flexuous & bristly

E. Wisl. giganteus globoso-ovatus costis 21 compressis crenato interruptis, areolis elongatis; aculeis radialibus patulis, summis infimisque sub 6 robustis, rigidis (subannulatis) lateralibus 14 20 (additis subinde summis fasciculatis) ~~tenuioribus~~ ~~tenuibus~~ elongatis flexuosis; centralibus 4, ~~robustis~~ crassis angulatis, annulatis rubellis 3 superioribus rectis ~~[illegible]~~ inferiore ~~longiore~~ canaliculato basi ~~[illegible]~~ squamoso — indicate

brevioribus tenuioribus

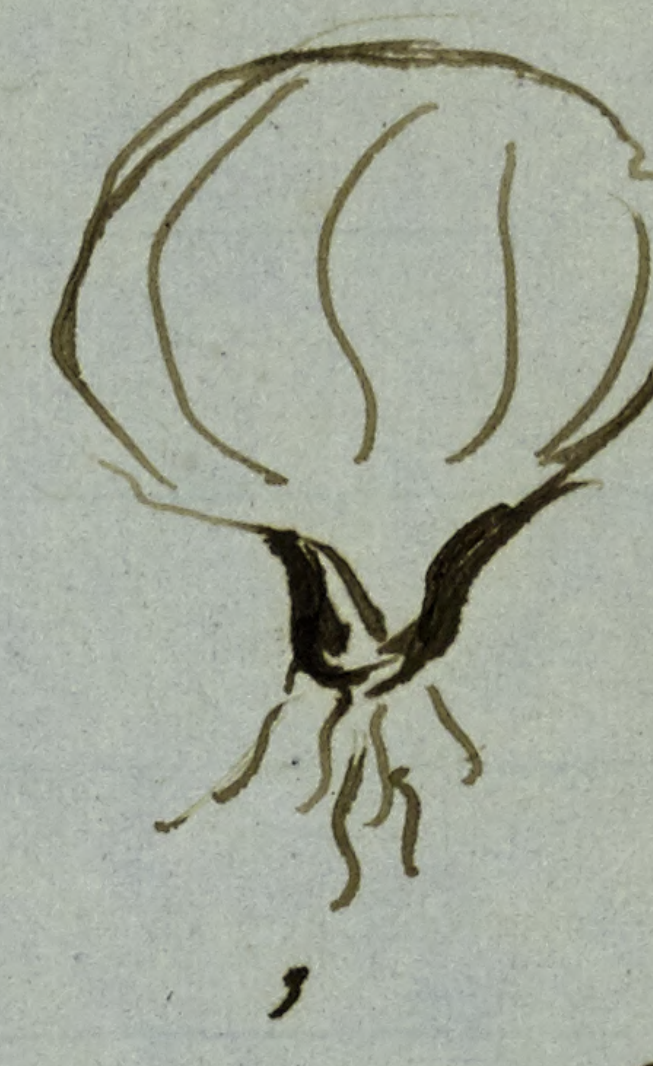
deorsum hamato.

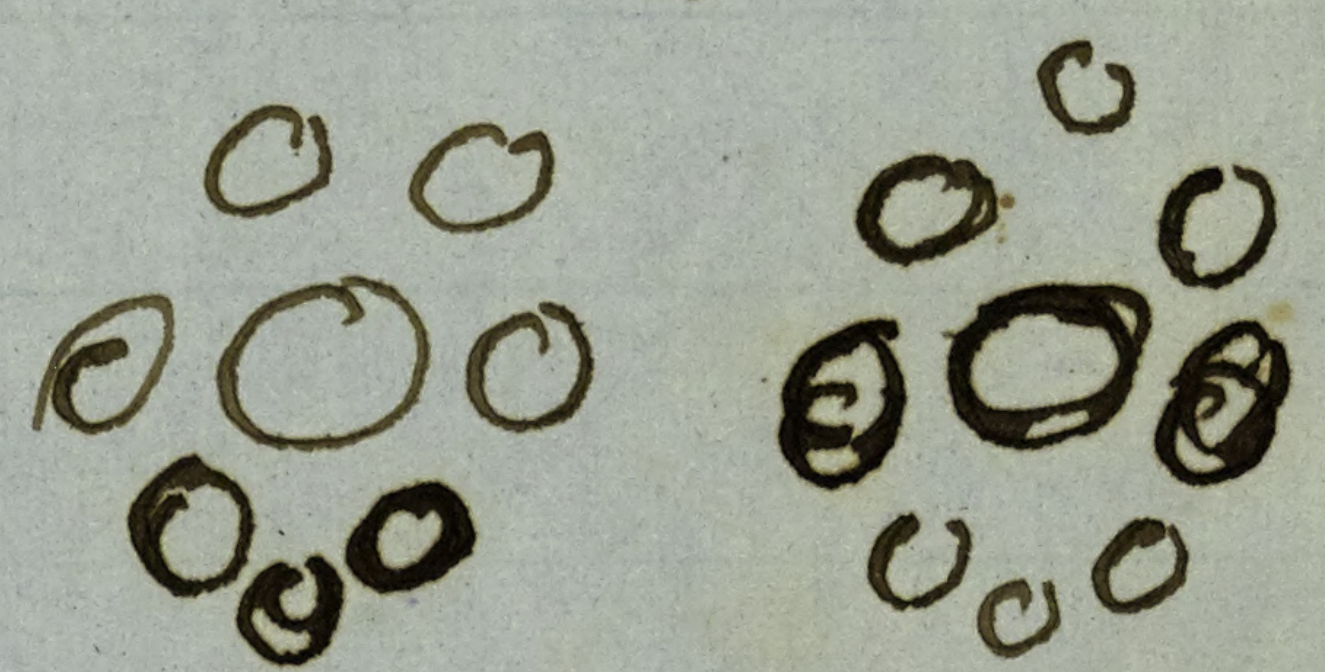
Echinocactus Bigelovii E.

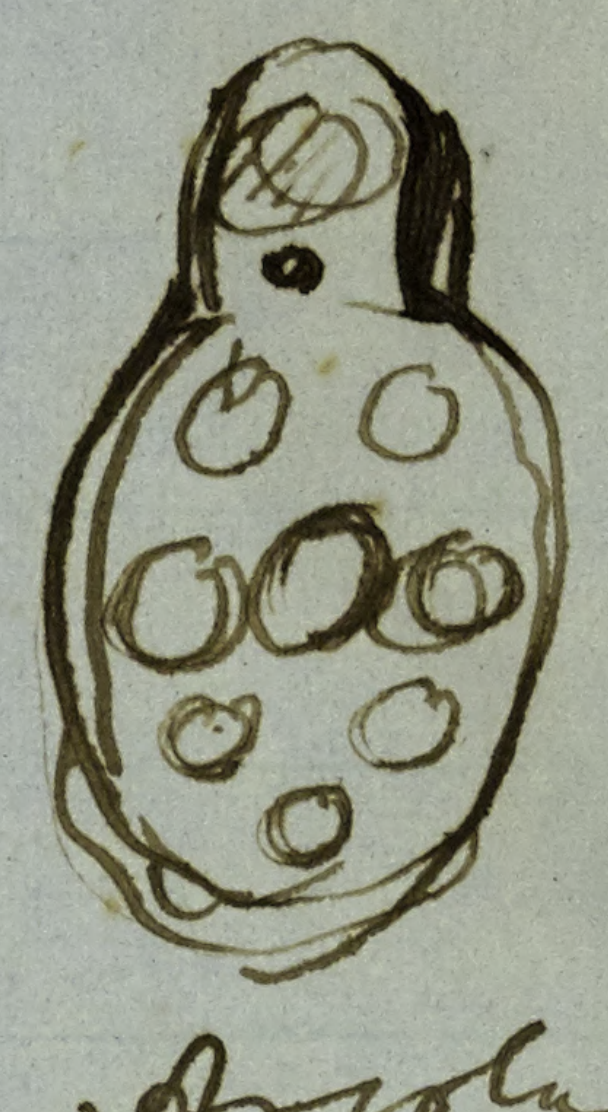
see pag 281

globosus, ~~[illegible]~~ ~~8-12~~ costis 8-13 tuberculatis interruptis; tuberculis prominentibus obtusis distantibus; areolis ovatis, aculeis ~~radialibus~~ omnibus subaequalibus robustis, annulatis ~~paulo~~ sub compressis, recurvatis s. rectiusculis fuscis versus apicem corneis radialibus 7 (6 lateralibus singulo inferiore brevior) s. addito summo, rarius 8; ~~1½~~ ~~poll.~~ centrali singulo robustiore teretiore paulo longiore, ~~[illegible]~~ porrecto s. ~~deflexum~~ deflexo arcuato s. subuncinato.

Coll. Probably on the Mojave and mixed with E. Engelmanni. The only specimen preserved ~~shows~~ is 9 inches in diameter, subglobose, contracted and almost stipitate below. On the lower part the areolae are elevated on distinct ovate ~~or subconfluent~~ tubercles which higher up become connected ~~[illegible]~~ ~~the ribs~~ in 8, and on the upper part of the plant in 13 ribs. Tubercles on upper part of plant ~~about~~ ½ to ¾ inches in diameter and of the same length. Areolae 1½ inches distant, ½ inch long a little less wide; the floral areola ~~smaller~~ closely connected with the former, separated from them by one to 3 indistinct subglobose glandular bodies half or entirely hidden in the tomentum.







Areola

Radial spines 1½ – 2 inches long, ~~the~~ ~~4~~ upper lateral longer and stouter, the 2 lower ones more slender, the lowest spine the shortest (1–1½ inch long) ~~straight~~ ~~curved~~ like the others or rarely hooked (similar to that sp in E. virid.); ~~the~~ ~~eighth~~ upper spine ~~is~~ ~~mostly wanting~~ similar to the other radial spines is rarely present ~~or if present resembles the upper lateral spines~~. The central spine is ~~stouter~~ ~~longer~~ about 2 inches long, more terete, at the point strongly recurved or sometimes ~~[illegible]~~ almost hooked — Spines of a reddish brown

196

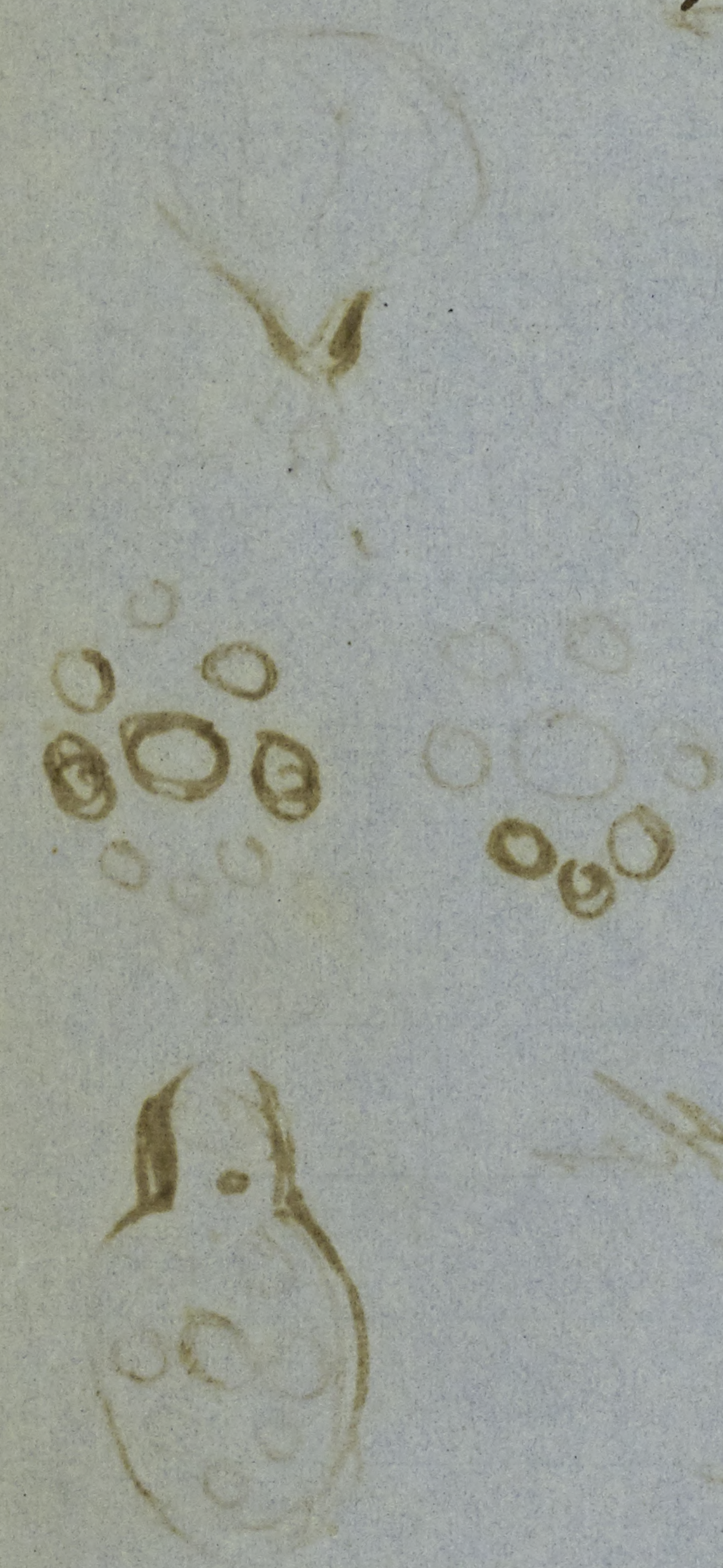
colour, lighter horncolour, and somewhat transparent at the tip

This plant in the number and colour of the spines seems to approach to E. Emoryi found by Maj. Emory on the upper Gila in October 1846, and described by me from Mr Stanley's ~~painting~~ sketch — but this has over 20 sharp ribs, and straight spines

see pag 105. 153

~~infra~~

Echinocactus Parryi (albispinus) simplex globosus s. ~~globoso~~-depressus, ~~13 costatis~~ 13 costis tuberculato-interruptis, saepe obliquis; areolis orbiculatis s. areola florifera adultiore ovatis, albo-tomentosis; aculeis omnibus robustis angulatis, plus minus compressis albidis, radialibus 8-11 rectis s. paulo curvatis, superioribus debilioribus, lateralibus robustioribus, infimo deficiente; centralibus 4, ~~3 superioribus~~ ~~robustioribus~~ robustioribus paulo longioribus, 3 sursum versis, singulo inferiore validiore, longiore, curvato deflexo. — flore? — ~~bacca~~ sicca oblonga ~~[illegible]~~, squamis aristato-spinosis tomentoque denso albido investita, flore coronata.



Found by Dr Parry in January 1852 and by Mr Wright and Dr Bigelow in April of that year in a region between El Paso and Lake Guzman, 60 or 80 miles in extent. — I have before ~~me~~ only a few bunches of spines coll by Mr Wright; the other data are obtained from Dr Parry's notes. The plant is about 8-12 inches high by 10-12 in diameter always simple the ribs are interrupted; the upper tubercles less distinct and flattened sideways, the lower older ones are transverse and very distinct ~~&~~ grooves between the ribs 1 inch deep.

3534

Cact 50 | Aug 1855 197

Areolae ½ inch in diameter, orbicular but with the floriferous areola, which is closely connected with it, oval, 9 l. long. Radial spines in my specimen ~~about 9~~ 8 or 9 (12-16 l. long) but according to Dr Parry's notes often as many as 11; lower ones diverging, stoutest, upper ones more slender; ~~the 4~~ central spines 4, stouter, and longer, (1½-2 inches long) somewhat bulbous at base; upper and lower one, especially the last, stoutest, and longest.—

This plant is evidently nearly allied to E. Engelmanni, but appears to be distinguished by the ~~whiter spi~~ simple, rather depressed heads, and the whiter spines. The fruit evidently resembles that of ~~the~~ different ~~species~~ of this section; and only the seed which unfortunately has been lost will ~~give me~~ definitely decide about the ~~identity or~~ distinctness of both plants which is strenuously maintained by Dr Bigelow who has seen both ~~species~~ in their native wild.

223

bicolor Gal. var) copy

Echinocactus Schottii simplex ovatus, s. ovato-cylindricus, costis 8 obtusis, tuberculato-interruptis; aculeis radialibus 15-17, rectis, inferioribus brevioribus teretiusculis (basi bulbosis rubello-variegatis), summis 2-4 longioribus latioribus compressis, albidis; centralibus 4, ~~rectis~~, albidis; summo latiore longiore supra plano, infra carinato recto s. pendulo sursum curvato, reliquis ~~intimis~~ ~~angu~~ compressis s. subteretibus, brevioribus, rectis.

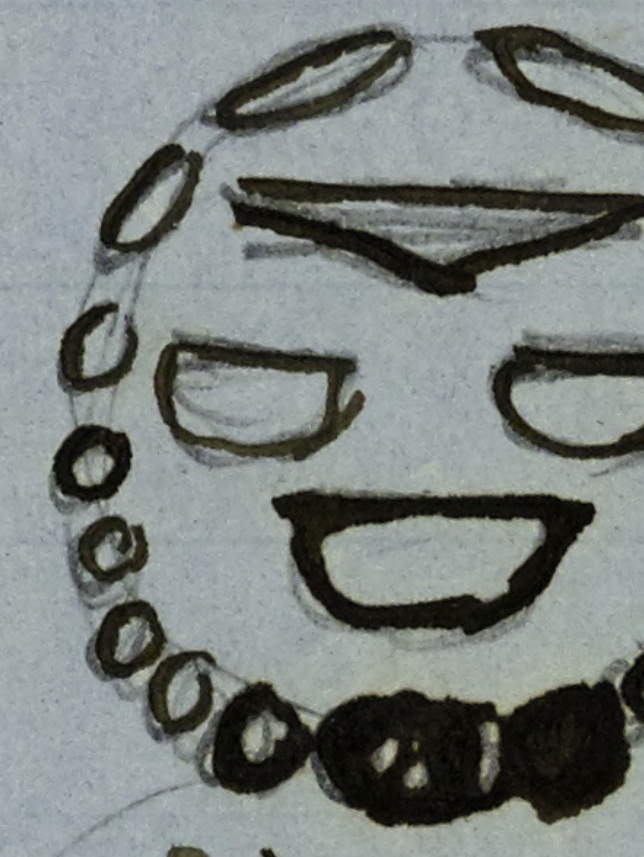


Diagram of spines But the lower radial spines not larger than others

198

majoris
floribus in vertice tomentoso subcentralibus; ovarii squamis sepaloideis 10–12 reniformibus margine ciliatis stipato, sepalis tubi superioris majoribus, sub 40, obtusis margine pallidioribus ciliatis summis oblongis; petalis purpureis; stigmatibus 8 suberectis

This elegant and distinguished species was collected Sept 1853 on a ~~g~~ solitary ~~ridge~~ hill range covered by chaparral, near Mier, a few miles above the mouth of the Rio Alcantaras into the Rio Grande, by Mr Arthur Schott, ~~in Sept 1853~~ who notwithstanding his arduous duties in the field, found time to observe and collect ~~many~~ and often even sketch interesting plants, ~~and~~ in whose honor I have named this species. It was found in full flower in September; no fruit was ~~notice~~ seen. Mr Schott informs me that his plant is 4 to 6 inches high by 2–3 in diameter; the grooves between the interrupted ribs are ~~rather~~ shallow; orbicular areolae when young ~~strongly~~ covered when young with ~~a~~ thick white wool, naked when old; floral areolae closely attached to the spiniferous one, without the cylindric glands of E. setispinus. – The 2 upper flat white radial spines about 1 inch long, the next pair narrower white, all the others ~~subtrigonate~~, ~~whitish~~ paler at base and tips and red in the ~~mi~~ middle; the lowest is the weakest and shortest, somewhat recurved. Upper central spi-

199

15–20 l. long the 3 others shorter the lowest central spine flat above rounded below, often somewhat reddish, like the lower radial spines. Flower between 2 & 3 inches long petals bright purple or rose-purple gradually paler in fading. Filaments from base of tube.

The shape and colour of flower as well as to some extent the arrangement of spines approaches this species to E. brevihamatus; but the want of a hook, the fact that the upper (central and radial) spines are the longest and the 8 ribs distinguish it from the whole section to which E. brevihamatus belongs. It seems to be more nearly allied to ~~it belongs th~~ [illegible] to ~~E.~~ E. bicolor & and E. porrectus. see 223

Mus

parvus Scheerii Salm

Echinocactus ~~pulchellus~~ ~~[illegible]~~ globosus, s. ovatus, costis 13 obtusis ~~interruptis~~ profunde incisso, tuberculis ovatis obtusis supra ad medium sulcatis; areolis ~~orbiculatis~~ subovato-orbiculatis, junioribus albo-tomentosis; aculeis radialibus 15–18 setaceis rigidis, rectis s. plerumque paulo recurvatis, albidis stramineisve, apice fuscatis; ~~summo~~ tantopere elongato; centralibus ~~3~~ -4 angulatis variegatis fusco-atris, superioribus rectis sursum divaricatis, ~~[illegible]~~, inferiore ~~hamato~~ porrecto breviore. Floribus in vertice laxis; sepalis exterioribus 13 squamiformibus, inferioribus ~~appendiculatis~~ acuminulatis margine membranaceo laceris ciliatisve, superioribus ovatis integriusculis, sepalis interioribus 8 lineari-oblongis obtusis s. intimis mucronatis; petalis 13 lineari-lanceolatis acutis, flavo-virescentibus; stigmatibus 8 linearibus flavidis. — bacca virescente vix squamata; sem. ~~[illegible]~~ naviculatis ovatis compressis fuscis, minutissime tuberculatis, ~~hilo~~

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200. ~~[illegible]~~ magno circulari basi

This ~~pretty~~ elegant little species
was discovered near Eaglepass by
(Dr Bigelow and Mr Schott.) the ~~latter~~ former
collected the flowers there from August
to October 1852, the latter sent living
specimens. The specimens before me
are 1½ to 1¾ inches in diameter
and of the same highth. The ~~root~~
long ~~te~~ terete (white fleshy) root of abt ½ inch
thick distinguishes this species
from all our other Echinocactinae
The tubercles also are more
distinct, and less plainly arranged
in ribs than in any other of our
species; they are somewhat compressed) between 4 and
5 lines high, of the same transverse
diameter and a little longer
in the direction of the rib, the areola
is abt ½ l. long ~~is~~ a little longer than broad; it extends
upwards into a tomentose groove
1-2½ lines long, which terminates
in the floriferous areola, about
halfway down to the axilla
of the tubercle. This groove
is much shorter or almost wanting
on such tubercles that bear no
flowers.

The ~~radial~~ exterior Spines, are with their
bulbous ~~compressed~~ bases closely
and regularly arranged all around
the areola, and are adpressedly
radiating; in younger plants
I find 11-13 in older, flowering
areolae always from 15 to 18 or
~~19~~. They are of almost equal
3-5 l. long length, or ~~the~~ lateral ones a little
~~longer~~ than the rest; ~~the upper~~
~~most one~~ The uppermost
~~radial~~ spine is often somewhat
stouter & elongated, ~~as if ranging itself with~~ ranging rather as an upper
& 4th central spine

3535

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Aug. 1855

~~the central spines~~ The ~~two~~ upper central spines (2 in my specimen from Eagle Pass, 3 in Schott's original plant) are stouter, generally somewhat compressed and angled ~~red~~ brown or black on the upper and whitish or mottled on the ~~under~~ lower surface; or the ~~upper~~ straight spines are ~~only~~ lighter throughout, with black tips; the hooked spine is black ~~above~~ on the upper side, especially at base, white below, again white on the outside of the curvature and entirely black ~~at~~ within and the hooked point; the former are 8-12 l. long, the latter only 6-9 l. long. —

The green flowers are about 1 inch long, but much less in diameter even when fully open.

~~Fruit and seed unknown~~‡

This species is nearly allied to E. brevihamatus, but is ~~a~~ much smaller plant distinguished by the cylindric long root, which is very distinct; tubercles not compressed & slender, much smaller & thinner, more numerous and more irregularly & closely arranged; spines, green flowers, fruit is not known for either.

see 105 **Mam. Lasiacantha**, fl. St Louis May 7th 1855

floribus lateralibus, sepalis 13, ~~superioribus~~ obtusis ~~mucronatis~~, superioribus mucronatis, petalis uniseriatis 13 ~~oblongis~~ obtusis s. emarginatis ~~patulis~~ ~~interdum~~ ~~subserrulatis~~; stylo stamina brevia longe superante, stigmatibus 4-5 ~~brevibus~~ ovatis erectis convergentibus.

Flowers 6 l. long and when fully open of same diameter; protruding about 3 lines above the spines; petals white with a red streak in the center, which ~~at base~~ ~~inside~~ at base forms a striking ~~red~~ field around the yellow stamens; Style yellowish with 4 or 5 yellowish green stigmata, which form together a short globose head. —

‡ fruit found according to [illegible] who has sent me a spec. of the plant and ~~to seed~~ small green and almost naked; seed large and brown! the only brown Ech. seed known to me 0.8 l. wide by 0.9-1.0 l. long, very minutely & bluntly tuberculate, albumen very inconspicuous, embryo curved, cotyledons small more like those of a Mammillaria on top, not at the end of the curvature like in all other Echinocacti known to me

Mam. Schiedeana Ehrenb. is similar but has much larger very woolly axillae, larger tubercles (and spines terminated by a silky brush) acute petals; fruit similar, seed black:

202

Mam. Greggii parva simplex globosa
~~umbilicata~~ tuberculis (~~[illegible]~~ ~~[illegible] globoso~~ ovatis)
globoso-ovatis minutis; aculeis setaceis
rigidis cinereo-albidis ~~pluri~~ 2-3 seriatis, interioribus
5-7 brevioribus robustioribus, omnibus
radiantibus; in plantae adultae tuberculis
junioribus aculeis ~~areolae~~ laxe lanatae ~~superioribus~~ 6-9
~~multo~~ longioribus apice clavatis acutis ~~demum~~
~~[illegible]~~ ~~refractis~~ fragilibus; baccis clavatis
nudis coccineis, seminibus obovatis
basi acutis hilo maximo ovato scaphoideis
minutissime ~~tuberculatis~~ nigris sub laevidis.

On a mountain ridge between Azufrosa and Penos Bravos near Saltillo, in fruit in September. Dr J. Gregg 1848. — "Plants 2-3 inches high" Gregg. — my specimens only 1 ~~1/2~~ 2 (3) inches in diameter; tubercles about 1-1¼ l. long;
15-18 Exterior spines 1½-2 l., interior ones ~~shorter~~, only ½-1 l. long, all radiating; on the upper end of the areola are in the full grown flowering spec. 6-9 longer spines (2-4 l. long) ~~white~~ imbedded in long loose wool thicker at base, very slender in the middle & clavate towards the very acute point; These spines when a year or two old break of at the slender portion in the middle, but can always be distinguished from the other spines by never being pointed but having a ~~[illegible]~~ ragged end when broken.

Fruit 9 l. long clavate, — seed 0.6–0,7 l. long

This species is ~~is~~ nearly allied to M. micromeris ~~for~~ but readily distinguished by the larger size of all parts, the ~~stouter~~ & fewer spines and the somewhat smaller and distinctly tuberculated seed.

The long fragile spines in the full grown plant present a curious feature, and with the long wool (about half of the length of those spines) form a tuft at the upper part of the plant, from which protrude flowers & fruit. It is a question with me whether the flowers are actually central in these two species, and whether the plant should not be arranged with the Coryphanthae; I have not seen the ~~latter~~ Greggii in the living state, and of M. micr. only young ~~[illegible]~~ plants with the tuft not yet developped. The dead specimens of both species show the fruit very nearly central in the dense tuft.

M. microthele Muhl (from Mexico?) seems to be very nearly allied to ~~these~~ species, ~~but the see~~ especially ~~to the~~ last one, but is caespitose has 2 central spines and no mention is made in the description of the curious tuft and the clavate spines so characteristic of both our species. ~~It is also~~

M. Greggii is only a larger, fewer spined var. of M. micromeris, with more distinctly tuberculated seeds

3536

Mam. pusilla var Texana

Dr Bigelow Santa Rosa

ovato-globosa prolifera caespitosa tuberculis ovato-cylindraceis, ~~teretibus~~, axillis albo lanatis, setosisque; aculeis pluriserialibus, extimis numerosissimis (30-50) capillaribus elongatis crispatis laevibus albidis, interioribus 10-12? sensim rigidioribus ~~brevioribus~~ rectiusculis puberulis albidis, intimis 5-8 longioribus rigidis rectis! puberulis basi bulbosis, ~~pubescentibus~~ supra albidis s. flavidis ~~supra~~ rufis fuscis ve; — floribus inaequalibus lateralibus; sepalis 9-11 oblongo linearibus, obtusiusculis, tenuiter fimbrillatis; petalis 13-16 uniseriatis, oblongo linearibus, obtusis s. emarginatis, saepe mucronatis, ~~stigmatibus~~ sub-5 erecto-patulis flavidis longe supra stamina exsertis, bacca elongata ~~obovata~~ s. subcylindrica, scarlatina, floris rudimentis involutis coronata; ~~seminibus~~ ~~nigris~~ obovatis scrobiculatis, nigris lucidis hilo lineari,

ovario submerso

versus apicem erosis

— Santa Rosa, Dr Bigelow, coll Jan 1853; fl. St Louis ~~June~~ April 1853. — Heads 1-1/2 inches in diameter; tubercles 3½-4 lines long, dark green; ~~[illegible]~~ axillae quite woolly, with several coarser curled bristles; ~~spines~~ Exterior spines covering the whole plant, as if it was enveloped in coarse wool often when extended straightened 6-8 l. long, but curled up; interior spines slender but quite stiff, and pointed, 3-4 l. long in young or weakly specimens whitish with dark tips, in robust ones yellow at base, brown above and almost blackish tips; —

Cact. 52

August 1855

Flowers 7-9 l. long, petals yellowish with a reddish streak; — fruit 3/4 inch long, seeds hard, brittle, 0.6 l. long — very similar to fruit and seed of M. lasiacantha, only a little larger. —

This plant is very nearly allied to M. pusilla DC, from the West Indies.

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Mamillaria sphaerica Dietrich

vide Poselger in Allg. Gart. Zeitung 1853
pag 94 —

~~prolifera~~ ~~simplex~~ obovata, clavata, prolifera ~~caespitosa~~ tuberculis
ovato elongatis versus apicem conicis
acutatis axillis lanatis, areolis juvenilibus breviter
tomentellis, aculeis setaceis, ~~rigidis~~
basi bulbosis ~~compressis~~ rectis s. curvatis, albidis radialibus 12 – 14.
centrali singulo recto subbreviore vix
stricto ~~contracto~~ robustiore; subulato fl. ovarium emersum tubo supra ~~tubo~~
elongato; petalis flavis sub 18 acuminato aristatis
integris stigmatibus 8 brevioribus patentibus; fruct?

Hillsides on the Rio Grande
near Eagle pass coll. in flower March 1852
by A Schott. Specimen before me
is 2 inches high, 1¾ in diameter above
~~[illegible]~~ narrowed below, the old tubercles
~~disarticulating~~ and leaving a short ~~clavate~~
scaly stem. Tubercles 6–8 l. long; Spines
3½ to 4½ l. long. Flowers 1½ – 2 inches
long, yellow.

Poselgers description perfectly well
agrees with my plant. His was collected
at Corpus Christi.

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Mamillaria Nuttallii ~~simplex s. caespitosa~~ ramis
ex tuberculis [illegible]
~~globos~~ globosa, simplex s. prolifera caespitosa
~~axillis nudis~~, sulcis tuberculorum junioribus barbatis
~~[illegible]~~ basi villosis; areolis junioribus
~~parce~~ albo tomentosis; aculeis radialibus
10-18 rectis s. parum curvatis, ~~plerum~~ plerumque pubescentibus, albidis, apice saepe fuscatis
inferioribus
superioribusque tenuioribus lateralibus
longioribus robustioribus, centrali singulo
(nunc in binis) robustiore s. deficiente.
puberulis, ~~laevi~~; floribus subcentralibus,
~~sepalis~~ ~~plerumque~~ lanceolatis s. linearis lanceolatis acutis
sepalis 10-25 fimbriatis, petalis 14-30 ~~[illegible]~~
~~integris albis~~ s. apice parum denticulatis ~~[illegible]~~
acutis mucronatis s. acuminatis flavis s. flavo-
virescentibus
demum saepe rubellis
stigmatibus 3-8 albidis erectis ~~obtusis~~ s. patulis
bacca laterali subglobosa tuberculis brevioribus simulata, demum flor. marcescente
dejecto; seminibus ~~globosis~~ (nigris) duris
scrobiculatis.
Mam. simpl. Torr. & Gr. Fl. I p. 553 non Haworth.
Cact. Mam. Nutt. non L.

α. borealis (M. Nuttallii E. Pl. Fendl. p. 49. 1848)
subsimplex ~~tuber. ovatis~~ aculeis gracilibus setaceis ~~tenuioribus~~ 13-17 ~~pubescentibus~~
(saepe deficiente)
centralique puberulis, (~~stigmatibus~~ ~~2 ad 5~~ erectis), floribus
brevis seminibusque minoribus.
~~Bottom lands from Fort Pierre to the~~
~~Yellowstone Nuttall, Hayden etc.~~ –
~~Dr Hayden has not~~ [illegible]

β. ~~similis~~ caespitosa (M. similis E. in Pl. Lindh. 1845)
(~~M.~~ similis β caespitosa E. in Pl. Lindh. 1850)
~~caespitosa~~ tub. ovat. aculeis radialibus ~~tenuioribus~~ 12-15
pubescentibus centrali plerumque deficiente
floribus brevis seminibusque majoribus stigmatibus 5-~~8~~
petalis;

γ. robustior E. E. Pl. Lindh. 1850
subsimplex tub. cylindraceis laxioribus aculeis robustioribus, ~~latioribus~~
radialibus 10-12 centrali singulo; floribus ~~majoribus~~
~~stigmat.~~ 7-8 petalis bacca seminibusque ut in β

In the plains east of the Rocky Mtns;
α has been found only in the Missouri
country ~~from~~ Fort Pierre westward
discovered by Nuttall, ~~collected since~~
repeatedly ~~and~~ ~~lately~~ principally
~~within the~~ in the last years by
Dr F.V. Hayden — Var β has been discovered
by F Lindheimer — in Texas ~~between~~
~~the Brazos & San Antonio Rivers~~
Southwest of the Brazos — and principally
in the country watered by the Colorado.
var γ has been found by the same
in the same region and lately
by Dr Bigelow on the Canadian.

The globose heads are from 1½–2
inches diameter; the cespitose
masses of β are often a foot in
diameter. — Tubercles in 8–13 spirals in α & β
3–4, in γ 5–6 lines long; in the
fully developped part of plants grooved to
~~the~~ base, where the groove expands
into a woolly floriferous areola; the
axilla proper, however is not
woolly. — Spines ~~3–5~~ in α & β 3–5
in γ 4–8 l. long; ~~in those forms~~
~~in most~~ in the 2 former the central
and the lateral radial spines are
pubescent, but hardly ever
the upper and lower ones.
Flowers subcentral or by the rapid ~~portion~~ growth of the plant more lateral ~~1–2 inches long~~; ~~smaller~~ ~~&~~ bright ~~yellow~~ yellow, yellowish green
or ~~with~~ of a reddish straw
colour; in α 1–1¼ inch long
with 10–13 sepals & 17–23 petals
and 2–3 ~~rarely 4 or 5~~ erect
stigmata; ~~seeds 0.8 l. long~~
base of the flower tube about 1 line
high naked, i.e. without free stamens

I have a cespitose ~~form~~ collected in the neighborhood of Fort Riley on the Kansas River which seems intermediate between β & γ.

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0 1 2 3 4 5 6 7 8 9 10
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MISSOURI BOTANICAL GARDEN

Cact. 53. Aug 1855

flowers in β. 1½–2 inches long, with 15–20 sepals ~~and~~ 20–25 petals, & 5 stigmata – in γ. of same length, with 20–25 sepals and 25–30 petals & 7–8 stigmata. Berry ~~short~~ 3–5 l. in diameter, shorter than the tubercles; seeds about globose, with a hard & brittle shell in α 0.8' and in β & γ 1.0–1.1 l. long, ~~with~~ distinctly pitted; hilum linear oblong.

Mam. calcarata. globosa ~~ex~~ tuberculosa sulcatis prolifera caespitosa, (rarissime simplex) ~~tuberculis~~ e basi dilatata ovatis s. ovato ~~cylindraceis~~ elongatis versus apicem conicis, supra in plantis adultis sulco (juniore barbato) notatis in areolam axillarem villosam demum denudatam desinente ~~notatis~~ exaratis, areola novella albo ~~villosa~~ tomentosa demum nuda, aculeis albidis apice saepe adustis radialibus 8–10 rigidis subulatis rectis, s. paulo recurvis additis subinde (aculeis ad ventem fasciculatis) ex summa areola 3–5 tenuioribus, ~~centrali~~ ~~nullo~~ s. singulo robustiore e basi bulbosa subulato recurvo (rarius binis superpositis) in plantis junioribus deficiente – floribus e vertice centralibus, magnis, ~~flavis~~ tubo supra ovarium protracto nudo, sepalis 20–35 ovatis s. lanceolatis acuminatis integris (ex viridi-flavis), petalis 30–35 lanceolatis, acuminatis aristatis versus apicem denticulatis (sulphureis s. subinde stramineis) intus basi cum filamentis miniatis) ~~filiformibus~~ ~~filamentis~~ stigmatibus ~~7~~–10 radiantibus flavis; seminibus fusco obovatis elongatis ~~atris~~ laevibus. ~~lucidis~~.

From the Brazos to the Nueces Lindh. Wright.

Perhaps M. strobiliformis Muehlenpf. (non Scheer nec Engelm.) coll. 1848 by F. Roemer on the Llano is the same species, – though nothing is said in the descr. of the characteristic curvature of the (spine) central, nor of the proliferousness.

Plant; heads 2–2½ inches in diam. and simple mostly proliferous from the upper end of the groove, and very cespitose; tubercles mostly erect or somewhat incurved, adpressed broad at base 7–9 l. long; × approximating cone 8 or 9 l. lg rad. spines ~~4~~–7, central sp. 5–~~8~~ or 9 l. long, from a very thick bulbous base recurved, ~~like~~;

~~Flo~~ Flowers 2¼–2½ inches long, same diameter; tube elongated, protracted above the ovary, cylindrical below and without sepaloid ~~scales~~ scales till it expands. — Petals wider and purer yellow in the plants from the Brazos and from N. Braunfels, and 3 l. wide; of a reddish straw colour and somewhat narrower in the Nueces plant; long acuminate and aristate; miniate at base like the outer filaments; inner ones greenish yellow; filaments from the ~~base~~ of tube to the base and even the top of the ovary. Fruit ovate, ¾ inch long; seeds smooth, ~~dark~~ brown, 1.0–1.3 l. long rather obtuse at lower end; ventral part compressed, sharp, back rounded; hilum small, oblong, towards the lower end.

in
× Younger plants shorter, more ovate, without a groove, and then always with naked axills; in the fully developed plants the groove extends to the axills and is there very woolly forming an "axillam lanatam" & not the wool or the bristles which often occur in the Mamillariae proper, a remnant of this areola florifera which is in the Coryphanthae connected with the areola spinifera by the groove?

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Mam. scolymoides Scheidw. Allg. G. Zeit. 1841

globosa s. (ovato-globosa), subsimplex, vertice dense lanato
tuberculis e basi dilatata ovato conicis
superioribus ~~cylindricis~~ elongatis, supra
~~sulcatis~~, areolam axillarem (juniorum villosissimam ~~tomentosa~~)
desinente notatis; aculeis erectis imbricatis radialibus
14-~~17~~ 20 basi bulbosa subcompressis arcte serriatis
~~rectis~~ s. plerumque paulo recurvatis,
albidis s. ~~[illegible]~~ corneis saepe apice fuscatis; inferioribus brevioribus
centralibus singulo s. in plantis adultis
saepe 2-4, longioribus, basi pallidis
supra fuscis nigricantibusve
superioribus sursum versis, inferiore robustiore cum radialibus implicato
longiore, obscuriore, deorsum curvato
floribus flavis - - - -

Coll by Dr Bigelow near Santa Rosa
and by Dr Wislizenus near Chihuahua
(see pg 18) 2-3 inches high, tubercles
in 13-21 spiral rows, 5-8 lin long; rad
spines of very different lengths, in
~~smaller plants from Sta Rosa~~ 5-10 long
~~in larger ones~~ the upper ones ~~generally~~
the longest; upper central spines 9-12 or 14 l. about in
lower one ~~[illegible]~~ the stouter, 9-16 l. long yg plts

Flowers said to be yellow, purple at
base, 2 inches long etc —
evidently near my calcarata.

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Mam. pectinata see pag. 130.

fl. July 13th 1855

floribus verticalibus, ovario globoso, tubo brevi, sepalis 30 acutis, aristatis, exterioribus lanceolatis ~~acutis~~ apice recurvis, interioribus oblanceolatis acutis, petalis 30 sulphureis, oblanceolatis, s. oblongis acutiusculis, s. intimis obtusis s. emarginatis, omnibus herbaceo-aristatis, stigm. 9–10 linearibus obtusis pallidis ~~atro~~ pallide ~~flavescentibus~~ stamina longe superantibus;

pluriserialibus

~~Upper~~ floriferous tubercles cylindric with one or more subglobose glands in the upper part of groove, representing as double the cylindric glands ~~of the~~ below the floriferous areola of Ech. setisp. Flowers 2 inches long 2 3/4 in diameter, open from 9–12 closing towards one o'clock; ovary 3–4 l. long; exterior sepals recurved at apex, reddish green with yellow margin, interior ones yellow with darker midrib. — Filaments covering the whole base of the tube — close to the style; red, short, —

Flower very similar to that of M. calcarata, but shorter, tube much shorter; petals broader more obtuse

seed 0.9 l. long. obovate elongate, compressed, rounded at back, sharp at ventral part
rounded at lower point.
hilum small, narrow above the point
seed very much like that of M. calcarata

M. Echinus rad sp 19–21, 4 central darker, concolor, lower one recurved; seed dark brown more curved than in the common form, 0.8 l. long – Presidio del Norte – Dr Bigelow.

Nuttallii ??

Hayden: Mam. vivipara — fl. — May 12th
single or cespitose — fl. 1½ inch long —
— ~~stig. 5 green~~ — pistil green
5 stigmata —
22 petals with 10–12 outer & only
between the forks of White River
acres are covered with it —

petals & sepals at base all ciliate
3–8 flowers on one plant.
Plant 2–3 inches distant, deep
in the ground

[illegible] distinguish M
sufficiently well from this plant
I shall have to mould the
accordingly;

M. vivipara Haw. char. emend.:
s. caespitosa, tuberculis laxis s.
teretibus, in plantis adultis sulco

Dr.

Ato Br. Oench,

1855.
July 1. To Balance

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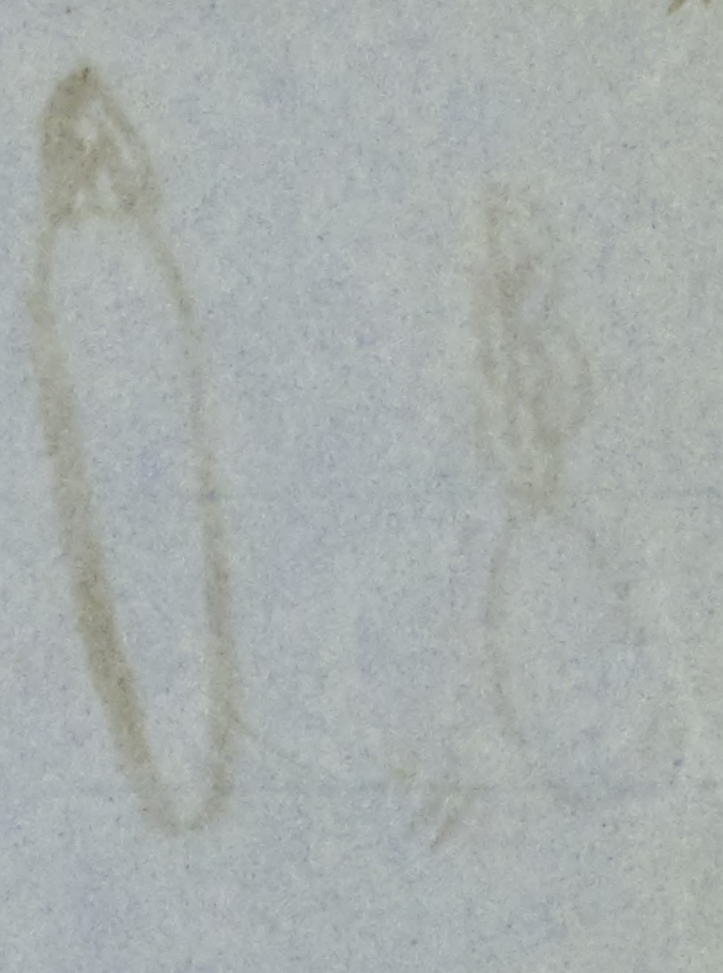
Cact. 54 Aug 1855 213



Another form has been collected by Dr Bigelow at Santa Rosa

aculeis radiantibus 16-17 superioribus fasciculatis, ... ; 8-10 l. longis imis 4-5 l. longis; centrali robusto a basi crassa subulato recto 7-8 l. longo.

Could this be a form of Scolymoides? Spines more slender, tubercles laxer.

M. scolymoides, M. Echinus, M. radians are nearly allied.

Mam compacta flower smaller than in any other of our Coryphanthae. ~~seed~~ sem. globoso-obovatis, lucidis laevibus fuscis, hilo magno ovato elongato

Seed only 0.7 long, shorter than seed of M calcarata, but thicker with much longer & larger hilum, which occupies almost the entire ventral part.

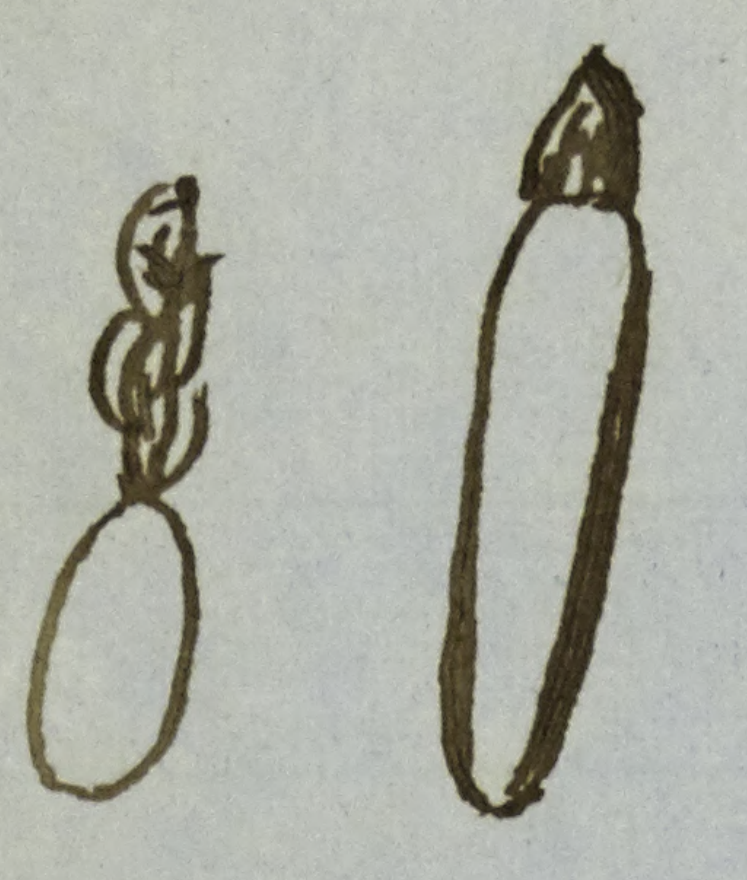
spines in some 4-6 in others 7-10 lines long.

see pag 143

Mam. tuberculosa Dr Bigelow collected on rocky places on the Franklin Mountains below El Paso dried specimens with flower and fruit, June 21. — which I can not take for any thing else but Mam. tuberculosa

Tubercles corky 2 l. long, very woolly in axills spines about 20 and 3-7 central, 3-9 lines long flowers about 1 inch long, with fimbriate sepals — All this agrees perfectly with M. tub.

but bacca elongata clavato-cylindracea rubra (8-10 l. longa) floris rudimentis brevibus (2 lin.) coronata, seminibus globoso-obovatis, fulvis, scrobiculatis 0.6 lin longis,


fruits

hilo brevi ovato.

Every thing, the long red fruit, the short regularly shrivelled corolla and the large light brown seed distinguish it from the other forms.

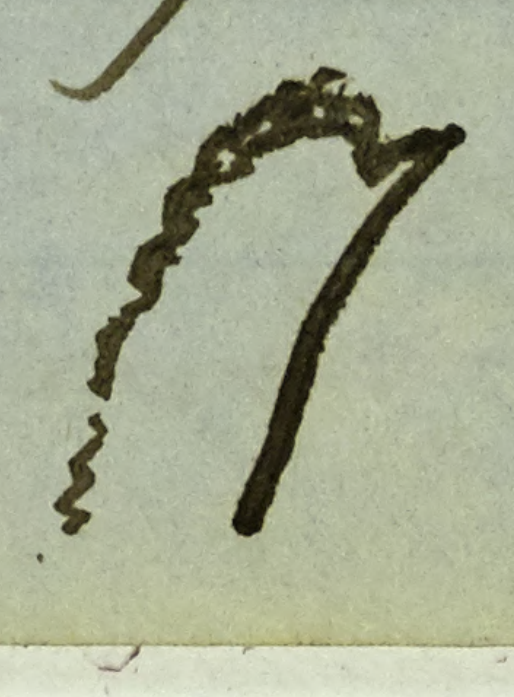
I shall have to describe the plant with the flower and fruit here described and add that another form or another species with the small dark seeds and oval fruit must be looked for.

Mamillaria vivipara Haw. ~~char. emend.~~

Dr Hayden has sent many specimens again none of his has flowered this season but I have observed may 30th a flower on one at the house of a trapper, brought down by him (in the soil which produced besides numerous plants of Bouteloua!

Hayden's Spec. in flower May 25th 1856
another received from Mr Carey
1852 in flower same day!
25 exterior sepals
20 interior ones
40 petals
Stamens from base of tube
stigmata 10, whitish
erect; (often ?)

Simple, globose, 3 inches in diam.; tubercles large, over 6 l. long. flower not quite central, but younger buds are; fl. 1½ inches long; sepals nearly 30, fimbriate, 18 exterior ones reflexed, about 12 interior ones of same length as petals 25–30 petals, lanceolate acuminate, aristate; anthers orange. style long exserted, 10 linear stigmata with very short mucro



filaments almost from base of tube
ovary very short depressed
filaments. Berrys of Dr Hayden's specim.
½–¾ inch long ovate s. globose-ovate,
not quite central; seed fulvous,
suborbiculate 0.6–0.8 l. long. with small oval
hilum.

Dr Hayden's specim. were simple
or with a few compact heads+, (from the
Black hills) or loosely caespitose,
but only cultivated specim. I have seen
so morbidly proliferous, as to
destroy almost the plant. Proliferous always
from the Areola at the base of the
groove. often the whole (originally
simple) plant covered with 20 or 30
sprouts.

+, this form seems a peculiar variety — heads depressed, into almost horizontal surface — tub. short, crowded spines short none seen — fl or fr.

Rad. sp. 12–20 . white, often brown at top
stiff;
Centr. sp. 3–8 stouter brown, the lower
3 or 4 ~~usually~~ the shortest, one only
erect or somewhat deflexed, the others
diverging laterally and upwards

I can not distinguish M. radiosa
sufficiently well from this plant.
I shall have to mould the characters
accordingly:

M. vivipara Haw. char. emend.: simplex
s. caespitosa, tuberculis laxis s. subimbricatis
teretibus, in planta adulta sulco (juniore barbato)
in areolam villosam axillarem s. superaxillarem
desinente notatis, axillis ipsis nudis;
aculeis rectis rigidis; exterioribus patentissime
radiantibus albis apice saepe sphacelatis 12–36
inferioribus rigidioribus, lateralibus superioribusque
longioribus tenuioribus cum brevioribus adventitiis

3540

additis; centralibus 3–12 robustioribus longioribus pl. m. purpurascentibus, fuscatis ve, singulo robustiore porrecto deflexove, ceteris ~~longioribus~~ sursum divergentibus; — floribus pag. 9 bacc. — sem.

α. **vera** depresso-globosa simplex s. caespitosa, ex axillis tuberculorum ~~tu~~ saepe amplissime prolifera; aculeis rad. 14–20 centr. 3–8; floribus ~~minoribus~~ subcentralibus; sepalis 30–40 petalis 25–40, stigmatibus 5–10 ~~petalis~~ ~~s~~ (breviter apiculatis) albidis s. roseis, patentibus; — baccis latentibus;

β. simplex
[illegible]
(Hayden)

β. ~~γ~~? radiosa M. radiosa E. in Pl. Lindh. II & in Salm. ~~Hort~~ Dyck. II. Ovata simplex s. e basi ramosa, aculeis rad. 12–36, centr. 3–12; ~~floribus~~ subcentralibus; sepalis 25–50 petalis 25–40, stigmatibus 5–10 obtusis, purpureis petalis; baccis latentibus

see pag 140

c ~~α~~. radiosa Texana
b b. radiosa neomexicana
a a. radiosa borealis

~~These forms both~~
The extreme forms, the simple, cylindric M. rad. tex. and the low caespitose M. vivipara ~~which~~ seem to be very distinct plants, but they show ~~gradually~~ transitions which force me to unite both forms. The caespitose growth, which is not constant and the apiculate stigma together with the more central flowers ~~which~~ ~~both forms are the only~~ ~~so~~ do not seem sufficient to establish specific distinction. —

Seed with considerable albumen more than I find in any other Mamillaria embryo terete, rather long, slightly hooked at the upper end and cotyledons pretty distinct; parallel! sometimes oblique and also sometimes as in other species 3!

Cact. 55 ~~fissuram~~ ~~fissuratum~~ fissuratum Aug. ~~1855~~ 1855 217

Anhalonium ~~verrucatum~~ ~~simplex~~

e radice crassa rapiformi simplex
~~obconica~~, ~~depressa~~ s. applanato-globoso, vertice
densissime villoso, tuberculis e basi
dilatata applanatis crassis triangularibus
- acuminibus (extus ~~[illegible]~~ inferne ~~grisea~~) obtuse ~~carinatis~~ ~~[illegible]~~ s. ~~[illegible]~~ versus marginem
crenulatum rugosis intus (s.
~~[illegible]~~, supra) ~~profunde~~ villoso-sul
sulco ~~profundo~~ centrali ~~[illegible]~~ villoso lateralibus duobus
lacribus ~~excavatis~~ profunde quadripartitis, sulcisque transversalibus
in tubercula angulosa irregularia
numerosa divisis multifidis; — floribus e villo longo
~~niveo~~ e centralibus brevitubulosis; sepalis sub 20 ~~carnosis~~
superioribus linear-lanceolatis integris
carnosis, albidis, superioribus spathulatis,
mucronatis; petalis sub 12 spathulatis,
~~[illegible]~~ versus apicem obtuse mucronatum laceris
s. integriusculis roseis; stigmatibus infundibuliformis, laciniis
5–10 ~~[illegible]~~ erectis patulis; ~~[illegible]~~
baccis ovatis pallide virescentibus coronatis, in lana
densa (occultis); seminibus globoso-obovatis tuberculatis
nigris, opacis. —

locality see pag. 152.

A very singular plant hardly ~~having~~
of the appearance of a Cactus! The Aloe shaped
tubercles which in other species of
~~A~~Anhalonium are smooth or in one
grooved, are here ~~cut up~~ ~~cutt up~~ (~~by 3 longitud. &~~
~~and numerous transverse grooves~~) ~~into~~ covered above
by a great many ~~irregularly angular~~
tubercles or warts, whence the name.
~~The central groove (contains a long wool) in young tubers &~~
~~in older ones it becomes matted and finally~~
~~disappears.~~ — ~~The central longitudinal groove in the young tubercles~~
~~The young half grown tubercles~~
~~rise from a subcylindric, or slightly~~
~~flattened base~~ —

F see next page.

~~The tubercles are flattened at base, of a transverse rhombic form, perfectly smooth; this part is like the larger ones~~

(hidden) Lower part of Tubercles ~~are~~ flattened, at ~~base~~ acute at the edges and slightly carinate ~~on~~ more on the upper and less on the lower surface & smooth ~~entirely hidden in the living plant~~; Upper visible part of tubercle is triangular in outline convex and carinate below, more convex and tuberculate above, ~~On this upper part only are the above described grooves; the middle longitudinal one, containing is filled with the long silky wool of rather straight smooth and glossy silk, which finally becomes matted, forming a cushi~~

~~White or pale yellowish~~

~~The longitudinal and transverse grooves~~

Tubercles cut up by 3 longitudinal and numerous transverse grooves into many irregularly angular ~~warts~~. The middle longitudinal groove expands towards its base into the floriferous areola & is in the young tubercles wattled by long & straighter silky white or yellowish wool, which in the full grown one gets matted, and dirty and finally (after several years) entirely disappears. ~~The grooves do not extent to the lower flattened part of tubercle, as has been stated~~, ‡ see next page

The flowers are „central" but this expression × must not be taken in the strictest sense of the word; they appear ~~to come~~ from the mass of long wool in the vertex of the plant but in reality are produced from the areolae at the base of the central groove, of the youngest

× here as in all these plants

× when bearing flower fr is somewhat thick &

tubercles. and are born by the lower smooth part which× takes the shape and function of a short peduncle, ~~pushing aside~~ bearing laterally the upper part of the tubercle, much like a bract.
The axills of even these young tubercles are entirely naked ~~the wool strings only~~ only the areola ~~areolar~~ groove producing the long ~~&~~ glossy wiry ~~straight~~ fibres which often are an inch in lengths and cover the lower part of the flower and hide the fruit entirely.

~~Tubercles 6-9 l. broad, lower part 2-3 upper~~
~~tubercled part~~ vermicose ~~5-7 l. long.~~

F The lower part of the plant is top shaped ~~the upper fissure~~ covered with the scale like remnants of the earlier tubercles;
the upper part hemispherical or depressed, flattened, ~~scarcely~~ hardly higher than the surface of the ground; 2-4½ inches in diameter.
tubercles in 8 or rarely 13 spiral rows; 6-10 l. broad, lower part 2-3 upper vermicose one 5-8 l. long;
Dr Parry informs me that he has seen specimens where the upper fissured part of the ~~tubercle~~ is ¾ inch long and 1¼ wide.

~~Flower~~ ♁ see last page

Flower about one inch long and in diameter, when fully open
ovary 3 l. long oval, tube 4-6 l. long
~~lower exterior sepals about 12 linear lanceolate, or fleshy whitish, upper ones~~ about 12 exterior sepals whitish, fleshy, lower ones lanceolate upper ones spathulate; 8 interior sepals spathulate mucronate, rose coloured on the edges; 6-9 l. long 2 l. wide
petals about 12 in a single series, linear spathulate, obtuse or often cuspidate or mucronate, and ~~laciniate~~ somewhat fringed. 9 l. long 2 l. wide
rose or ~~purple~~ pink. colour.
Stamens numerous white with orange anthers; style white expanding into a funnelshaped light yellow ~~stigma~~ irregularly ~~with~~ 5-10 parted stigma
Fruit oval, covered with the remnants of the flower, about 5 l. long entirely

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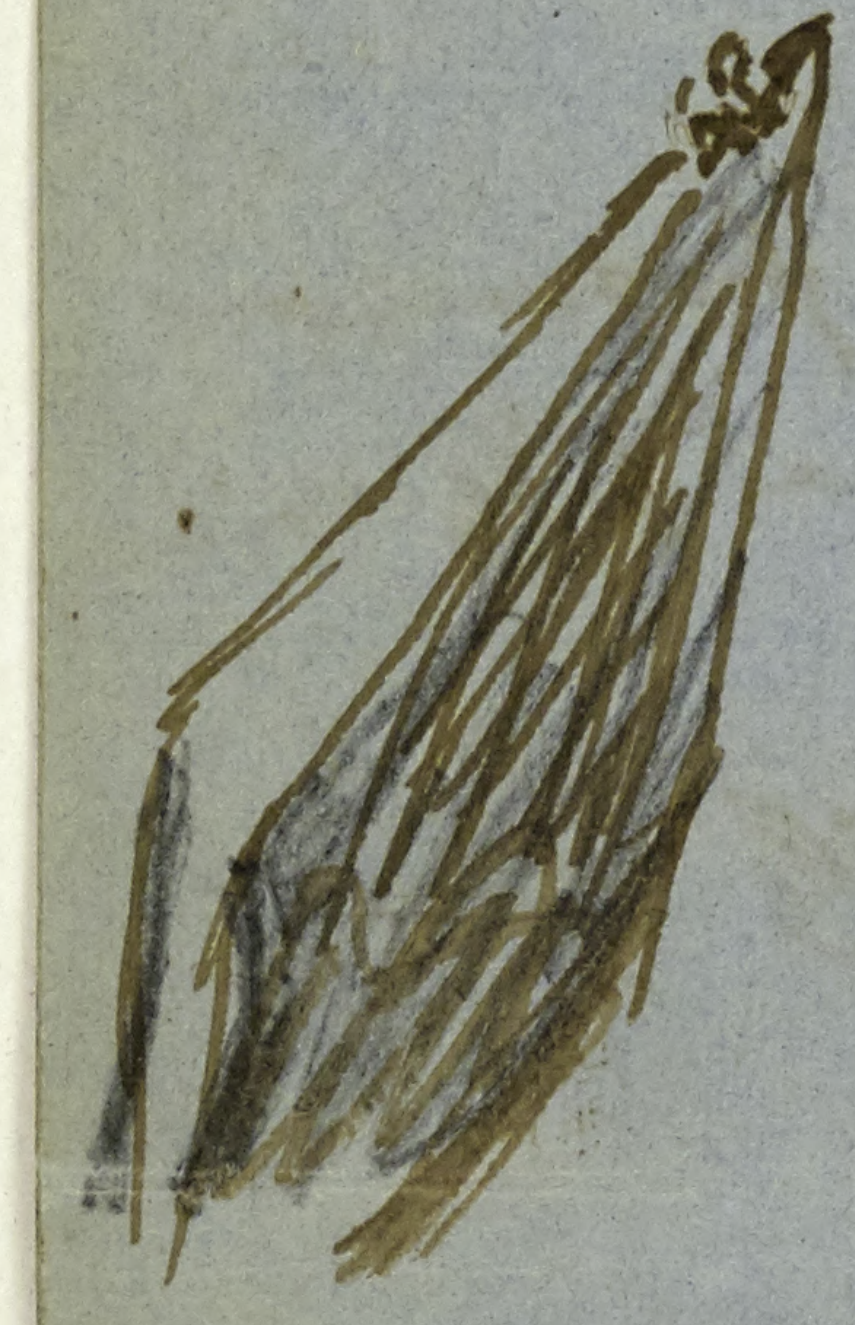
hidden in the long areolar wool: seed (globose-obovate) nearly straight, with the orbicular areola at base, — 0,8''' long, remarkably rough and tuberculated. —

see figure pag. 153.

Anhalonium prismaticum Mexico, received from Pr. Salm (ought to be named pyramidatum; there is nothing prismatic in the 3 cornered pyramidal tubercle!) — has the same long straight finally matted wool, but it appears to come as much as I can see in a dead & broken up specimen from the real axillae or base of lowest scaly part of tubercle; small areola, short woolly when quite young, and below the point of the tubercle sometimes with a few spines. Here is something for morphology! —



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